AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF CLAIMS:

1-19. (cancelled)

20.(new) A method for determining the quality of plant material by determining a chlorophyll fluorescence image of said plant material, wherein the plant material is irradiated with a beam of electromagnetic radiation comprising one or more such wavelengths that at least a part of the chlorophyll present is excited by at least a part of the radiation, the beam of electromagnetic radiation having such a shape that only a small part of the plant material is irradiated, and the beam being moved over the plant material such that a larger part of the plant material is irradiated, wherein the fluorescence radiation originating from the plant material associated with the chlorophyll transition, is measured with an imaging detector for obtaining a chlorophyll fluorescence image, wherein, in any given order,

during a certain duration of time several fast scans are made over the plant material with the electromagnetic beam for obtaining a chlorophyll fluorescence image Ffast, and

during a certain duration of time a slow scan is made over the plant material with the electromagnetic beam for obtaining a chlorophyll fluorescence image Fslow, and subsequently

the characteristic chlorophyll fluorescence image that is a measure for the efficiency of the photosynthetic system of plant material is calculated from the chlorophyll fluorescence images Ffast and Fslow.

21.(new) A method according to claim 20, the characteristic chlorophyll fluorescence image containing information about the quantum efficiency of the photosynthetic activity of the photosynthetic system of the plant material and this image being calculated with the formula

$$IQP=(Fslow-Ffast)/Fslow$$

22.(new) A method according to claim 20, the beam having the shape of a thin line.

23.(new) A method according to claim 20, the beam being moved such over the plant material that the entire surface of the plant material is irradiated.

24.(new) A method according to claim 20, the electromagnetic radiation used for irradiating the plant material having a wavelength of between 200 and 750 nm.

25.(new) A method according to claim 20, the electromagnetic radiation used for irradiating the plant material being generated by a lamp, laser of LED-lamp.

26.(new) A method according to claim 20, the fluorescence radiation originating from the plant material being measured between 600 and 800 nm.

27.(new) A method according to claim 20, the fluorescence radiation originating from the plant material being measured with an electronic camera consisting of a video camera, CCD-camera, line scan camera or a number of photodiodes or photomultipliers.

28.(new) A method according to claim 20, the characteristic chlorophyll fluorescence image containing information about the quantum efficiency of the photosynthetic activity of the photosynthetic system of the plant material and this image being calculated with the formula

$$IQP=(Fslow-Ffast)/Fslow$$

the beam having the shape of a thin line and being moved such over the plant material that the entire surface of the plant material is irradiated, said electromagnetic radiation being generated by a lamp, laser of LED-lamp and having a wavelength of between 200 and 750 nm, said fluorescence being measured between 600 and 800 nm with an electronic camera consisting of a video camera, CCD-camera, line scan camera or a number of photodiodes or photomultipliers.

29.(new) A device for determining the quality of plant material using a method as defined in claim 20, comprising first means for irradiating the plant material with a beam of electromagnetic radiation comprising one or more such wavelengths that at least a part of the chlorophyll present in the plant material is excitated, first means for scanning the beam of electromagnetic radiation over the plant material with a high scan frequency, first means for measuring the fluorescence radiation originating from the plant material for obtaining a chlorophyll fluorescence image (Ffast) associated with the fast scan, second means for irradiating the plant material with a beam of electromagnetic radiation comprising one or more such wavelengths that at least a part of the chlorophyll present in the plant material is excitated, second means for scanning the beam of electromagnetic radiation over the plant material with a low scan frequency, second means for measuring the fluorescence radiation originating from the plant material for obtaining a

chlorophyll fluorescence image (Fslow) associated with the slow scan and means for processing the chlorophyll fluorescence images Ffast and Fslow, wherein said processing means is provided with calculating means for calculating a characteristic chlorophyll fluorescence image that is a measure for the quantum efficiency of the photosynthetic activity of the photosynthetic system of the plant material.

30.(new) A device according to claim 29, the first and second means for irradiating the plant material consisting of the same laser wherein the laser line is scanned with a high frequency and a low frequency, respectively, over the plant material, the first and second means for measuring the chlorophyll fluorescence images consisting of a camera connected to a computer and the means for processing the fluorescence images consisting of a computer provided with software for processing the chlorophyll fluorescence images of the fast and the slow scan, wherein said software performs the step of calculating a characteristic chlorophyll fluorescence image that is a measure for the quantum efficiency of the photosynthetic activity of the photosynthetic system of the plant material from Ffast and Fslow.

31.(new) A method for separating plant material consisting of individual components into several fractions each having a different quality, wherein a characteristic parameter is determined for each component using the method as defined in claim 20 and the fractions of components having the characteristic parameter in the same pre-determined range are collected.

32.(new) A method according to claim 31, the plant material consisting of plants, cut flowers, leaf material, fruits, berries, vegetables, flowers, flower organs, roots, tissue culture, seeds, bulbs, algae, mosses and tubers of plants.

33.(new) A method according to claim 32, each individual component consisting of separate plants, cut flowers, leaf material, fruits, berries, vegetables, flowers, flower organs, roots, tissue culture, seeds, bulbs, algae, mosses and tubers of plants.

34.(new) A device for separating plant material consisting of individual components into several fractions each having a different quality, comprising a supply part for the plant material, a device as defined in claim 29, that determines a characteristic parameter for each component, and a separation part that separates the components into fractions of components having the characteristic parameter in the same pre-determined range.

35.(new) A device for classifying plant material consisting of individual components into several fractions each having a different quality, comprising a moving structure that localises the plant material, a device as defined in claim 29 that determines a characteristic parameter for each component, and a classification part that collects fractions of components having the characteristic parameter in the same pre-determined range.

36.(new) A device for determining the quality of plant material, comprising a light source for irradiating the plant material with a beam of electromagnetic radiation comprising one or more such wavelengths that at least a part of the chlorophyll present in the plant material is excited, a first beam scanner for scanning the beam of electromagnetic radiation several times over the plant material with a high scan frequency, a first detector for measuring the fluorescence radiation originating from the plant material for obtaining a chlorophyll fluorescence image (Ffast) associated with the fast scan, a second light source for irradiating the plant material with a beam of

electromagnetic radiation comprising one or more such wavelengths that at least a part of the chlorophyll present in the plant material is excitated, a second beam scanner for scanning the beam of electromagnetic radiation over the plant material with a low scan frequency, second means for measuring the fluorescence radiation originating from the plant material for obtaining a chlorophyll fluorescence image (Fslow) associated with the slow scan and a processor for processing the chlorophyll fluorescence images Ffast and Fslow, wherein said processor is provided with a calculator for calculating a characteristic chlorophyll fluorescence image that is a measure for the quantum efficiency of the photosynthetic activity of the photosynthetic system of the plant material.

37.(new) A device according to claim 36, said first and second light sources consisting of the same laser wherein the laser line is scanned with a high frequency and a low frequency, respectively, over the plant material, the first and second detectors consisting of a camera connected to a computer and the processor consisting of a computer provided with software for processing the chlorophyll fluorescence images of the fast and the slow scan, wherein said software performs the step of calculating a characteristic chlorophyll fluorescence image that is a measure for the quantum efficiency of the photosynthetic activity of the photosynthetic system of the plant material from Ffast and Fslow.

38.(new) A device for determining the quality of plant material comprising a computer that calculates a characteristic chlorophyll fluorescence image that is a measure for the quantum efficiency of the photosynthetic activity of the photosynthetic system of the plant material from chlorophyll fluorescence images Ffast and Fslow, wherein Ffast is obtained by scanning with a high frequency a beam of electromagnetic radiation comprising one or more such wavelengths that at least a part of the chlorophyll present is

excitated by at least a part of the radiation, and having such a shape that only a small part of the plant material is irradiated, over the plant material and measuring the fluorescence radiation originating from the plant material associated with the chlorophyll transition and Fslow is obtained by scanning with a low frequency a beam of electromagnetic radiation comprising one or more such wavelengths that at least a part of the chlorophyll present is excitated by at least a part of the radiation, and having such a shape that only a small part of the plant material is irradiated, over the plant material and measuring the fluorescence radiation originating from the plant material associated with the chlorophyll transition.

39.(new) A carrier comprising software that, when loaded in a computer, calculates a characteristic chlorophyll fluorescence image that is a measure for the quantum efficiency of the photosynthetic activity of the photosynthetic system of the plant material from chlorophyll fluorescence images Ffast and Fslow, wherein Ffast is obtained by scanning with a high frequency a beam of electromagnetic radiation comprising one or more such wavelengths that at least a part of the chlorophyll present is excitated by at least a part of the radiation, and having such a shape that only a small part of the plant material is irradiated, over the plant material and measuring the fluorescence radiation originating from the plant material associated with the chlorophyll transition and Fslow is obtained by scanning with a low frequency a beam of electromagnetic radiation comprising one or more such wavelengths that at least a part of the chlorophyll present is excitated by at least a part of the radiation, and having such a shape that only a small part of the plant material is irradiated, over the plant material and measuring the fluorescence radiation originating from the plant material associated with the chlorophyll transition.